

Bacterial Dermohypodermatitis of the Upper Limb: Epidemiology and Associated Risk Factors in Dakar (Senegal)

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Abstract

Introduction: Bacterial dermohypodermatitis (BDH) is the leading cause of hospitalization in dermatology departments in Dakar. They constitute a public health challenge. The prevalence in France is estimated at 10 to 100 cases per 100,000 inhabitants, with a predominance of lower limb localization. Upper limb forms are rarely reported. The aim of our study was to determine the epidemiological, clinical, therapeutic and evolutionary aspects of BDH of the upper limb.

Methodology: We conducted a descriptive and analytical cross-sectional study of the records of patients hospitalized for upper limb DHB in the Dermatology Department of the Aristide Le Dantec hospital over a 10-year (January 2011 to December 2021).

Results: We collected 21 cases of BDH of the upper limb, representing a hospital frequency of 0.62%. The sex ratio was 0.16. The mean age of patients was 46 years. Non-steroidal anti-inflammatory drugs were used in 7 cases (33.3%), with symptoms worsening in 87.7%. Bacterial dermohypodermatitis was non-necrotizing in 15 cases (71.4%), and necrotizing in 6 (28.6%). There was a point of entry in 10 cases (47.6%). Amoxicillin-clavulanic acid has been used in 18 cases (85.71%). Surgical debridement has been performed in 5 cases (23.8%). Progress was favorable in 17 cases (80.95%). The factors associated with DHB of the upper limb were: artificial depigmentation in 11 cases (52.4%), obesity in 6 cases (28.57%) and diabetes in 4 cases (19%). Skin local risk factors included lymphedema in one case secondary to lymph node dissection (4.8%).

Conclusion: Our study confirms the rarity of DHB of the upper limb, with a clear female predominance. Lymphedema, the existence of an entry point and artificial depigmentation are the main factors associated with DHB of the upper limb.

Keywords: *Bacterial dermohypodermatitis; Upper limb; Dakar*

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1. Introduction

Bacterial dermohypodermatitis (BHD) is an acute skin infection most often caused by group A beta-hemolytic streptococci. They constitute a really public health challenge in our countries, due to their resurgence. Their Severity is linked to the risk of sepsis and residual lymphedema. They often affect young adults aged between 40 and 45, and are predominantly female [1]. Many bacterial germs are involved, but dominated by group A beta-hemolytic streptococci [2]. Bacterial dermohypodermatitis of the lower limbs representing for 85% of cases of BDH. Their high prevalence is linked to the existence of risk factors in Africa and Europe [3]. Localization in the upper limbs is rare, represent for 11.1% [2]. However, few studies have been reported in Africa on the risk factors associated with the upper limbs. The aim of our study were to determine the clinical, therapeutic and evolutionary epidemiological profile of bacterial dermohypodermatitis of the upper limb, and to identify associated risk factors.

2. Patients and Methods

We conducted a descriptive cross-sectional study over a 10-year from January 2011 to December 2021 in the dermatology department of Aristide Le Dantec Hospital. We included all patients hospitalized for bacterial dermo-hypodermatitis of the upper limb. The diagnosis of non-necrotizing BHD was recognized by an acute warm inflammatory swelling associated or not with an erythematous plaque or bulla localized to the upper limb. The diagnosis of necrotizing BHD was based on acute warm inflammatory swelling of the upper limb associated with bullae, cutaneous necrosis and escharotic plaque.

Paraclinical examinations included blood cells count, C-reactive protein, sedimentation rate, fasting blood sugar, liver enzymes, urea and creatinine. Imaging included soft-tissue ultrasound, cardiovascular doppler ultrasound, electrocardiogram and soft-tissue MRI. The Data collection was based on a questionnaire collecting sociodemographic, clinical, paraclinical, therapeutic and evolutionary informations. Data entry and analysis have been performed using SPSS 20.0 software.

3. Results

We recorded 21 cases of bacterial dermo-hypodermatitis of the upper limb out of 3339 patients hospitalized during the study period, representing a hospital frequency of 0.62%. The mean age of patients was 46.57 years, with extremes ranging from 30 to 67 years. FIG. 1 shows the age distribution of patients. Patients were female in 18 cases (85.7%) and male in 3 cases (14.3%), i.e. a sex ratio of 0.16. There was a history of mastectomy with lymph node dissection in 3 cases. General signs were fever in 11 cases and cardiac arrhythmia in one case. BHD was non-necrotizing in 15 cases (FIG. 2) and necrotizing in 6 (FIG. 3). Bullous detachment was associated with BHD in 11 cases (52.4%) and satellite adenopathy in 3 cases (14.3%). Risk factors were the existence of a post-traumatic lesions as a point of entry (23.8%), eczema (9.5%), venitis (9.5%) and surgical scarring (4.8%). Skin locoregional risk factors included lymphedema in 4.8%. General risk factors included artificial depigmentation in 11 cases, obesity in 6 and diabetes in 4. TABLE 1 illustrates the general risk factors for BHD. The depigmenting products used were topical steroids in 8 cases and hydroquinone in 8 cases, and the average length of depigmentation was 9 years, with extremes of 2 and 20 years.

Biologically, a predominantly neutrophilic hyperleukocytosis was noted in 8 cases (38.09%), with a mean of 17135/mm³ and extremes ranging from 12800 to 23780/mm³. The sedimentation rate was accelerated in 91.66%. C-reactiv protein was positive in 92.85% of cases. Inflammatory anemia has been noted in 63.15%, thrombocytosis in 16.66%, and electrocardiograms in 4 cases showed sinus tachycardia in 3 and ST-segment elevation in one. Vascular Doppler ultrasound has been performed in 2 cases was normal. Parenteral antibiotic therapy has been given in all patients with BHD. The antibiotics used were penicillin G (14.2%) and amoxicillin-clavulanic acid (90.4%). TABLE 2 illustrates the antibiotics used in treatment. Analgesics were have been administered in 14 cases, anticoagulants in 8 cases and surgical debridement in 5 cases. The preventive treatment included late-acting penicillin and venous compression in 2 cases. The average length of stay for a hospitalization was 17 days, with extremes of [2-45 days]. The outcome of BHD was favorable in 17 cases (80.95%). Complications included lymphedema of the upper limb and one death in a case secondary to septic shock.

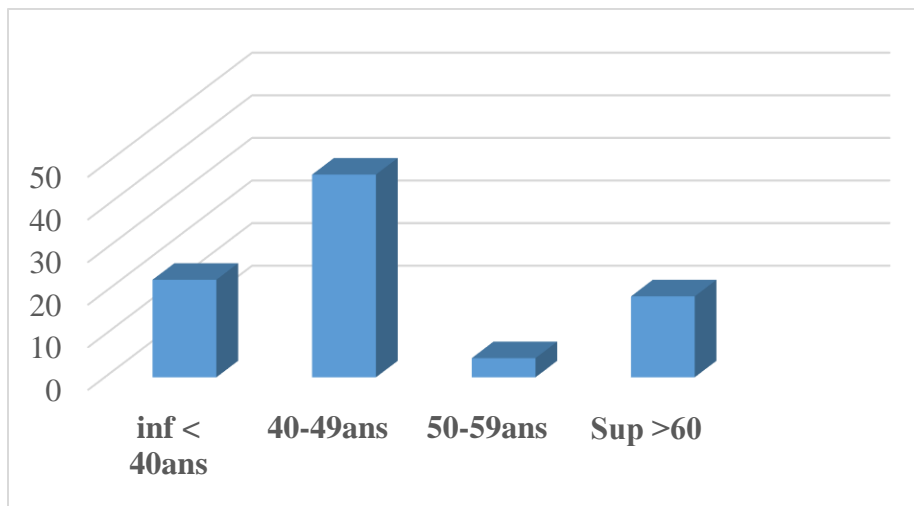


FIG. 1. Distribution according to age groups of DHB of the upper limb.



FIG. 2. Erysipelas of the upper limb associated with breast cancer.



FIG. 3. Upper limb necrotizing fasciitis.

TABLE 1. Factors associated with bacterial dermohypodermatitis of the upper limb.

Risk factors	Number	Percentage (%)
Artificial depigmentation	11	52,4
Obesity	6	28,5
High blood pressure	4	19
Diabetes	4	19
HIV infection	2	9,5
Smoking	3	14,3
Alcoholism	1	4,8

TABLE 2. **Distribution of patients according to antibiotic treatments.**

Antibiotics		Number	Percentage
Beta lactam	Amoxicillin clavulanic acid	19	90,4
	Pénicillin G	3	14,2
	Amoxicillin	1	4,7
	Ampicilline	3	14,2
	Ceftriaxone	3	14,2
	Extencillin	3	14,2
Imidazole	Metronidazole	4	19
Aminogluco-side	Gentamicin	7	33,33
Quinolone	Ciprofloxacin	1	4,76

4. Discussion

We report 21 cases of bacterial dermohypodermatitis of the upper limb over a 10-year. Hospital prevalence varies worldwide from 0.62% in our study, 2% in Europe, 8.6% in the Maghreb, 3.9% to 10% in Africa [2-4]. The mean age of patients was 46.57 years with a predominance of females. This seems to be related to voluntary cosmetic depigmentation [4-6]. In our study, a delay of patients to come to consult the doctors has been noted, with an average delay of 5 to 10 days. This delay seems to be related to the use of traditional plants before as the first-line treatment and to inaccessibility to specialized care [7-9].

Non-necrotizing BHD were predominant in our study, in contrast to the literature, where necrotizing forms are more common in the upper limbs [4]. We noted several local risk factors associated with the occurrence of BHD of the upper limb, namely the existence of an entry point such as traumatic lesions, excoriated dermatosis and venous inflammation. These factors have also been reported in previous African studies [3,7,10,11]. Lymphedema was the main risk factor in 4.8% of cases; in Europe, its prevalence is higher in 18% of cases [9,12]. Veno-lymphatic insufficiency provides an environment conducive to microbial proliferation and increased risk of lymphangitis or BHD. Artificial depigmentation with topical steroids (52.4% in our study) is a particular risk factor for BHD in sub-Saharan Africa. Indeed, many previous studies confirm its role in the recrudescence of BHD, with an odds ratio of 4.29 [13]. The use of depigmenting products made with topical steroids leads to local immunosuppression, skin atrophy and changes in skin bacterial flora. All these factors contribute to the development of BHD. Other general risk factors included obesity (19%), hypertension (19%) and diabetes (19%) [13]. The aggravating effect of non-steroidal anti-inflammatory drugs on non-necrotizing BHD has been recognized by some authors [10,14]. In 90% of cases, their use at the onset of symptoms of bacterial dermohypodermatitis aggravates BHD [10]. A biological inflammatory

syndrome is often observed in the course of BHD, and we have not found any pathogens from local samples or blood cultures. Intravenous amoxicillin/clavulanic acid was the first-line treatment for BHD in 90.47% of our study. In the literature, penicillin G was the first-line antibiotic [8,10,13]. The extensive use of amoxicillin-clavulanic acid was linked to its availability in our countries [10].

Surgical treatment has been performed in 23.8% (n=5). Delayed-acting penicillin and compression on the upper limbs were the preventive measures used in our patients. Favourable progress was in 80.95% of cases. These results are in line with the literature.

5. Conclusion

Bacterial dermohypodermatitis of the upper limb is rare in Dakar. They are dominated by non-necrotizing forms. The main associated risk factors are the existence of an entry point, lymphedema, depigmentation and obesity. The use of non-steroidal anti-inflammatory drugs is a major aggravating factor. Early management and preventive treatment of recurrences improve patients' long-term prognosis.

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